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| 10/615,772 | 07/10/2003 | Mickaele Le Ravalec-Dupin | 612.42904X00 | 5959 |
| 20457 7590 11/28/2007 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873 | | | EXAMINER SILVER, DAVID | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/615,772

Applicant(s)

LE RAVALEC-DUPIN ET AL.

Examiner

David Silver

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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DETAILED ACTION

1. The prosecution of the Instant Application is now before Examiner David Silver.
2. The Instant Office Action is in response to a Request for Continued Examination filed 9/06/2007.
3. Claims 27-42 are currently pending in Instant Application.

Priority

4. Claim to priority is acknowledged **(02/08.714 07/11/2002 FRANCE)**

Response to Arguments

Response: 35 U.S.C. § 101

5. **Applicants argue:**

"Claim 27 has been amended to recite "associating with said reservoir model a permeability field constructed by a priori geologic data and production data or pressure data obtained from well tests collected in said reservoir" and "using said reservoir model including said corrections propagated to said set of grid cells to develop said underground reservoir". Therefore, the rejection of claims 27-42 is submitted to be overcome in view of the recitation of "associating with said reservoir model...production data or pressure data obtained from well tests collected in said reservoir..." and "using the reservoir model to develop the underground reservoir" as disclosed in the original specification." (Remarks: page 8)

6. **Examiner Response:**

The argued first limitation merely adds that the reservoir model has associated a priori geologic data and production data or pressure data obtained from well tests from a reservoir. This is not considered a final result of the claimed invention. The argued last limitation recites intended use of "using said reservoir model [...] to develop said underground reservoir". This limitation is not given patentable weight as it is merely intended use without actual steps of how that model is being used in the development of the reservoir.

Rejection is maintained.

Response: 35 U.S.C. § 102

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7. Applicants' arguments are moot in view of new grounds of rejection necessitated by amendments.

Claim Interpretation

8. Limitations drawn to allowing, enabling or making optional a function's performance does not further limit a claim. As such, any prior art not explicitly prohibiting the performance of the function inherently anticipates the limitation.

Claim Objections

9. Applicant is advised that should claim 31 be found allowable, claim 32 (also claim 39 and 40) will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).
10. All dependent claims are objected to for not following USPTO guidelines for claim language. Dependent claims should start with "The", rather than "A".

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 27-42 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 recites, in part:

"...USPTO personnel shall review the claim to determine it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the *final* result achieved by the claimed invention is "useful, tangible, and concrete." (emphasis added)

- 11.1 The method claims do not produce a useful, tangible, and concrete final result. The steps of the method claims do not produce a useful, tangible, and concrete result. They merely recite a software algorithm, per se, which, for example, does not display, store, or otherwise provide a useful tangible output. Note exemplary claim 27 which only recites software steps and does not produce a useful tangible and concrete **final result**. See MPEP 2106 [R-5] (partially recited above). The last limitation

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recites intended use of "using said reservoir model [...] to develop said underground reservoir". This limitation is not given patentable weight as it is merely intended use without actual steps of how that model is being used in the development of the reservoir.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 27-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the

enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As per claim 27, the limitation "using said reservoir model [...] to develop said underground reservoir" is not disclosed in such a way as to enable one of ordinary skill in the art to make and use the invention without undue experimentation.

13. Claims 27-42 are rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 27, the term "effective permeabilities" renders the claim indefinite. Specifically, how is a permeability effective and what makes it "effective"?

As per claim 27, the claim recites "improve calibration" however no calibration is actually taking place. It is unclear what is being calibrated and how it is being calibrated.

As per claims 31-34, the term "within a framework of well tests" renders the claims indefinite.

Specifically, what is a framework of well tests and what are its metes and bounds.

14. Claims not specifically mentioned are rejected by virtue of their dependency.

15. The Applicants are required to fix all other similar occurrences of the above-cited deficiencies.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 27-28, 31-32, 35-36, 39-40 are rejected under 35 U.S.C. 102(e) as being anticipated by

Rouffignac (**US 20020029882**).

Rouffignac discloses: 27. A method for constructing a reservoir model representative of an underground reservoir, including discretizing said reservoir by a set of grid cells, and associating with said reservoir model a permeability field constrained by a priori geologic data and production data or pressure data obtained from well tests collected in said reservoir comprising:

a) constructing an initial reservoir model including generating a permeability field (**para 521**) in accordance with a stochastic model (**para 951**), coherent with the a priori geologic data (**para 570**);

b) identifying zones inside said reservoir (**para 55, 22, 366**);

c) calculating effective permeabilities of said zones and carrying out, by means of a simulator, a simulation of fluid flows (**para 739, 112, 521, 874, 952**), to estimate corrections to be brought to said effective permeabilities to improve calibration in relation to said production data or pressure data obtained from well tests (**para 961**);

d) propagating said corrections to said set of grid cells of said reservoir model, by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model (**para 64, 961, 408, 482**);
and

e) using said reservoir model, including said correction propagated to said set of grid cells, to develop said underground reservoir (**38, 987**).

Rouffignac discloses: 28. A method as claimed in claim 27 comprising using said reservoir model to

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develop an oil reservoir **(38, 987, 19, 584)**.

Rouffignac discloses: 31. A method as claimed in claim 27, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir, within a framework of well tests **(para 277)**.

As per claims 32, note the rejection of claims 31 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

Rouffignac discloses: 35. A method as claimed in claim 27, wherein at least one gradual deformation parameter is assigned to each of said zones **(para 950)**.

As per claims 36, 39-40, note the rejection of claims 35 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 27-28, 31-32, 35-36, 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khan (US 6,826,520) above, and in view of Rouffignac (US 20020029882).

As per claim 27, Khan discloses a method for constructing a reservoir model representative of an underground reservoir, including discretizing said reservoir by a set of grid cells, and associating with said reservoir model a permeability field comprising: a) constructing an initial reservoir model including generating a permeability field in accordance with a stochastic model, coherent with the a priori geologic data **(Fig 1 and description, col: 5 line: 51-61)**; b) identifying zones inside said reservoir **(col: 5 line: 51-61)**; c) calculating effective permeabilities of said zones and carrying out, by means of a

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simulator, a simulation of fluid flows (**col: 5 line: 51-61**), to estimate corrections to be brought to said effective permeabilities to improve calibration in relation to said production data or pressure data obtained from well tests (**col: 12 line: 42-59**); d) propagating said corrections to said set of grid cells of said reservoir model, by means of an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model (**col: 11 line: 6-12**). Khan however does not expressly disclose a permeability field constrained by a priori geologic data and production data or pressure data obtained from well tests collected in said reservoir and e) using said reservoir model, including said correction propagated to said set of grid cells, to develop said underground reservoir. Rouffignac however discloses the said features (**para 570, 38, 987**). It would have been obvious to one of ordinary skill in the art <reservoir simulation, modeling, and development> at the time of Applicant's invention to combine the references in order to 1) use real results from well tests as inputs such that the simulation results are more accurate and reflect real-world situations.

Rouffignac discloses: 28. A method as claimed in claim 27 comprising using said reservoir model to develop an oil reservoir (**38, 987, 19, 584**).

Rouffignac discloses: 31. A method as claimed in claim 27, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir, within a framework of well tests (**para 277**).

Rouffignac discloses: 31. A method as claimed in claim 27, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir, within a framework of well tests (para 277).

As per claims 32, note the rejection of claims 31 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

Rouffignac discloses: 35. A method as claimed in claim 27, wherein at least one gradual deformation parameter is assigned to each of said zones (**para 950**).

As per claims 36, 39-40, note the rejection of claims 35 above. The Instant Claims recite substantially

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same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

18. Claims 29-30, 33-34, 37-38, and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khan (**US 6,826,520**) above, and in view of Rouffignac (**US 20020029882**), as applied to claim 27, and further in view of Cullick (**US 6,549,879**).

As per claim 29, the combination of Khan and Rouffignac fully discloses claim 27. The combination however does not expressly disclose A method as claimed in claim 27, wherein flow simulation is carried out by means of a streamline simulator, said zones of said underground reservoir are identified by a set of grid cells traversed by one or more streamlines of fixed geometry and said zones are defined either manually or automatically from said flow simulator (para 621). Cullick however discloses the said feature (**col: 5 line: 33-39, col: 7 line: 40-51**). It would have been obvious to use the streamline simulation as it is significantly faster than traditional permeability simulations and thus saves time and costs associated therewith.

As per claim 30, the combination of Khan and Rouffignac fully discloses claim 27. The combination however does not expressly disclose a method as claimed in claim 27, wherein flow simulation is carried out by means of a streamline simulator and said zones of said underground reservoir are identified by a set of grid cells traversed by one or more streamlines of fixed geometry. Cullick however discloses the said feature (**col: 5 line: 33-39, col: 7 line: 40-51**). It would have been obvious to use the streamline simulation as it is significantly faster than traditional permeability simulations and thus saves time and costs associated therewith.

As per claims 33-34, 37-38, and 41-42, note the rejection of claims 31 and 35 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings in view of the combination above.

Support for Amendments and Newly Added Claims

19. Applicants are respectfully requested, in the event of an amendment to claims or submission of new claims, that such claims and their limitations be directly mapped to the specification, which provides support for the subject matter. This will assist in expediting compact prosecution. MPEP 714.02

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recites: "Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP § 2163.06. An amendment which does not comply with the provisions of 37 CFR 1.121(b), (c), (d), and (h) may be held not fully responsive. See MPEP § 714." **Amendments not pointing to specific support in the disclosure may be deemed as not complying with provisions of 37 C.F.R. 1.131(b), (c), (d), and (h) and therefore held not fully responsive.** Generic statements such as "Applicants believe no new matter has been introduced" may be deemed insufficient.

Requests for Interview

20. In accordance with 37 CFR 1.133(a)(3), requests for interview must be made in advance.
- 20.1 Interview requests are to be made by telephone (571-272-8634) call or FAX (571-273-8634).
- 20.2 Applicants must provide a detailed agenda as to what will be discussed (generic statement such as "discuss §102 rejection" or "discuss rejections of claims 1-3" may be denied interview).
- 20.3 The detail agenda along with any proposed amendments is to be written on a PTOL-413A or a custom form and should be faxed (or emailed, subject to MPEP 713.01.I / MPEP 502.03) to the Examiner at least 4 days prior to the scheduled interview.
21. Interview requests submitted within amendments may be denied because the Examiner was not notified, in advance, of the Applicant Initiated Interview Request and due to time constraints may not be able to review the interview request to prior to the mailing of the next Office Action.

Conclusion

22. All claims are rejected.
23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 10am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained from

either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should


you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at

866-217-9197 (toll-free).

/ DAVID SILVER /

David Silver, Patent Examiner

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KAMINI SHAH
SUPERVISORY PATENT EXAMINER